

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>PCT-138</b>	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. <b>PCT/AT2004/000263</b>	International filing date (day/month/year) <b>22.07.2004</b>	Priority date (day/month/year) <b>24.07.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>C01B13/02</b>		
Applicant <b>GHÉCZY, Rudolf</b>		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>1</u> sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2), with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2), with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/AT2004/000263

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-9 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 2-11 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1 \_\_\_\_\_ received by this Authority on 21.02.2005 WITH LETTER
- nos.\* \_\_\_\_\_ received by this Authority on OF 15.02.2005
- ☒ the drawings:
- sheets 1/1 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	3-9	YES
	Claims	1, 2, 10, 11	NO
Inventive step (IS)	Claims	3	YES
	Claims	1, 2, 4-11	NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<p>This report makes reference to the following documents:</p>			
<p>D1: US-A-4526775 (Air Products and Chemicals)</p>			
<p>D2: EP-A-583748 (Air Products and Chemicals)</p>			
<p>D3: XP2218385 (Angewandte Chemie Int. Ed. 2000, 39, 3772-3789)</p>			
<p>1. The application fails to meet the requirements of PCT Article 6 because claim 1 is not clear.</p>			
<p>1.1. The present claim 1 defines that a liquid ionic compound is used for the absorption. It is clear from the description that the applicant is using a very particular interpretation of this statement (see page 5, paragraphs 1-3; page 6, third paragraph).</p>			
<p>Although this statement is used often, this examiner is of the opinion that any liquid with ions falls under the term "liquid ionic compound". For example, molten salts are also liquid ionic compounds.</p>			

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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Claim 1 is not clear. This lack of clarity also leads to problems with regard to the novelty of the claims (see point 3.1 below).

- 1.2. Claim 1 also defines that "at least one ionic liquid having high reversible oxygen-absorbing capability that is selective to other gases, in particular, nitrogen, is used as a medium". Claim 1 therefore attempts to define the subject matter in terms of the result to be achieved. Claim 1 fails to describe **how the result is achieved** (see PCT Guidelines 5.35).

Claim 1 is not clear.

As stated in these guidelines, an objection with regard to lack of support by the description can also be raised in such a case. Technical support can be found in the description only for certain ionic liquids mentioned in the application.

The applicant argued in his response to the written opinion that oxygen absorption is a substance property. This fact is not disputed. However, the present claims do not define which compounds are used. The present claim is therefore valid for **all** compounds that have this property, whereas only several thereof are disclosed in the application.

2. The invention does not appear to be sufficiently disclosed (PCT Article 5).

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The present application is directed to the use of ***all ionic liquids suitable for oxygen absorption*** (see also point 1 above). The application does not contain any examples. Only page 6 of the description mentions several possible ionic liquids.

A person skilled in the art is surely not in a position to carry out the invention across the entire claimed scope. It seems, to the examiner, that the invention can be carried out only for the liquids disclosed on page 6.

The applicant argued in his response to the written opinion that the ionic liquid is limited to liquids having oxygen-absorbing capability and a melting point of less than 80°C. However, the claims are not at all limited to a particular melting point, which shows that the claims are not disclosed across the entire claimed scope. Although the claims are limited to a particular oxygen-absorbing capability, **all** ionic liquids with this property are claimed. This broad scope is not disclosed in the application.

3. The present application fails to meet the requirements of PCT Article 33(1) because the subject matter of claims 1, 2, 10 and 11 is not novel within the meaning of PCT Article 33(2).

- 3.1. D1 discloses a method of recovering oxygen from

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

air. In this method, the oxygen is absorbed in a molten salt. The salt contains nitrate, nitrite and peroxide as anions and sodium and potassium as cations. The absorbed oxygen is released by reducing pressure or increasing temperature (see claims 1 to 11).

The molten salt falls under the term "ionic liquid" (see point 1 above).

The applicant has shown that the melting points of the salts of D1 are much higher than the melting points of the ionic liquids of the present application. However, claim 1 defines only that the medium is liquid at the process temperature. This is also the case in D1.

The applicant also argued that the molten material in D1 is very corrosive. The use of corrosive mediums is not, however, excluded in claim 1.

The subject matter of claims 1, 2, 10 and 11 is not novel.

**3.2.** The subject matter of claim 1 is novel over D2. D2 discloses the use of an aqueous solution of cobalt-containing complexes for the recovery of oxygen. The applicant has convincingly argued that D2 does not disclose any compounds that are liquid at the process temperature.

**4.** The subject matter of claims 4 to 9 does not

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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involve an inventive step because the subject matter of these claims is made up of merely obvious features in light of D1.

5. The subject matter of claim 3 is novel and involves an inventive step.

D1 is considered to be the closest prior art. The subject matter of claim 3 is distinguished from D1 in that, in claim 3, an ionic liquid with a high concentration of perfluorinated groups is used, whereas in D1 a molten salt medium is used.

The result of this distinguishing feature is that oxygen absorption can be carried out at a lower temperature. Although such ionic liquids are known from D3, D3 does not suggest that such liquids could be used for oxygen absorption.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

**Box I****Basis of the report**

1. The amendment in claim 1 fails to meet the requirements of PCT Article 34(2)(b).

The original claim 1 defined that an ionic liquid having **high** reversible selective oxygen-absorbing capability ... is used. The term *high* has now been deleted from the claim. Although the term *high* is only a relative term, the deletion thereof from the claim broadens the scope of the subject matter.

The opinion with regard to inventive step is therefore based on claim 1 in the original version.